ABSTRACT OF THE DISCLOSURE

A physically compact, wideband signal activity identification, demodulation and characterization, and direction finding device incorporates multiple and cascadable digital signal processing modules operating in asynchronous real time. The digital signal processing modules include a device for data buffering, a device for digital signal processing (DSP), and a device for high-speed data routing. The module device for data buffering is composed of, among other memory devices, a First In Tap Out (FITO) data buffer that may be accessed at any point for delay or faster than real time re-synchronization by the DSP module device. The module device for digital signal processing function incorporates a general purpose digital processor for respective module calculation of overlapped hyperchannelization Fast Fourier Transforms (FFT). Hyperchannels may be combine in a flexible manner to tailor channel bandwidth for optimum signal spectral detection of signal activity, synthesis filter and tuning, demodulation and recognition, and direction finding. The module device for high-speed data routing is composed of one-to-one, one-to-many, or many-to-one digital data routing functions, and allows flexible ordering of digital signal processing modules.